

## **THE ENERGY TRANSITION DILEMMA IN EUROPEAN UNION (EU) REGION**

Mae Luky Iriani<sup>1</sup>

<sup>1</sup> Program Studi Magister Hubungan Internasional,  
Universitas Katolik Parahyangan,  
[mae.lucky@gmail.com](mailto:mae.lucky@gmail.com)

### **Abstract**

*The European Union has been facing an energy crisis since 2020 that is made worse by the extreme weather in winter and the hasty energy transition across mainland Europe. As the global world demands cleaner energy and renewable energy for all, the EU may have to strategize better to gradually shift from fossil fuel and anticipate the uncertainty and the volatility of renewable energy. This paper will examine the possible cause and sustainable solution to ensure the countries are still able to secure their environmental target, without severe consequences, economically and socially while maintaining their political legitimacy in dealing with Russia. The method used for this research includes a literature review. The outlook of the crisis will be depended on the securitization effort by the EU and solidarity amongst its members. EU will also still require fossil fuels to ease the transition to renewable energy in the coming years.*

**Keywords:** Energy Crisis, Energy Transition, EU, Energy Security, Renewables.

### **INTRODUCTION**

With the growing population and the finite availability of fossil fuel, the ability to access energy sources and to develop renewable energy become more important than ever. Renewable energy such as wind, solar power's availability may also be disrupted during major event, such as long winter, windless summer and other inherently unpredictable weather dynamics. Energy crisis is the condition where there is a prospect of resources constraint, limited resources, disrupted security of supply and the heightened concern from environmental perspective (Coyle & Simmons, 2014). This environmental background is the core of EU intention to achieve net zero greenhouse emission by 2050. Starting 2010, EU has increased

their commitment to renewable energy and lower their investment or production capacity on fossil fuel (*Energy Dashboard*, n.d.)

However, due to unforeseen extreme weather and prolonged windless summer in Europe resulting in low supply of electricity generated by wind turbine that further impacted the current condition in Europe. Throughout 2020-2021, Europe is facing a colder than usual winter that increased the demand of electricity (*Europe's Energy Crisis Is About to Get Worse as Winter Arrives - Bloomberg*, n.d.). This condition also made worse by the disrupted supply chain due to pandemic.

Based on the recent reports, Europe may have transitioned too fast to renewable energy and renewable energy capacity may not be ready for primary sources of electricity (*Europe's Self-Inflicted Energy Crisis*, n.d.). However, there is a global pressure to lower the emission and transition to renewable energy as soon as possible as fossil fuel and non-renewable caused a lot of environmental damage. This energy transition has roadmaps that also highlight the importance of energy access, security as well as transition readiness, which include participation and political stability (Singh et al., 2019). Investing and developing reliable renewable energy plants require significant investment and it is arguably still not as economical as conventional power plant. This may be the cause for different perspective in prioritising the renewable energy development in certain EU member states (Mata Pérez et al., 2019).

Energy has always been the most politicized commodity as it ensures a national security (van de Graaf et al., 2016), hence many bilateral agreements and diplomacy were made to guarantee each participating country's interest (Firmansyah & Anggraeni, 2021). Europe has one of the leading research and technologies in renewable energy but still it was not able to anticipate the volatility of the weather and securing an ample supply of electricity. Based on these literatures, the author would also like to make a small contribution to these studies, by examining this case with the

perspective of energy security and the notion of better energy transition in Europe without putting the most vulnerable society as the collateral damage. This article may also provide as a lesson learned for Indonesia as the country plans to reach net zero green emission by 2070 and this study may provide an important lesson learned on how to avoid similar blunder.

Additionally, it is also important to ensure the ability of a community to be able to access energy services. As this constitutes as one of the main tenets of Freedom from the Want dimension of human security. Under the realm of Non-traditional security, countries however big or small are all vulnerable in the dynamic of energy supply and demand. These may include: accessibility, affordability, efficiency and sustainability. Then it is important to determine which one of these dimensions to prioritize by EU to secure its member countries from energy crisis.

### **Theoretical Framework**

According to Buzan, the general assumption is that the international actors are inclined to get more power and that energy is a part of security of a country (Buzan et al., 1998) . The social process amongst the countries dynamic resulted into security issue. In this particular case study, the securitization actor is EU, referent objects are the members, and the imminent threat is the energy crisis or a condition of having limited energy availability. However, to help identify and assess the current situation from the non-traditional perspective, Melly Cabarello framework of five dimensions of Energy Security (Melly Cabarello-Anthony, 2015) would be suitable to explain and elaborate the case.

To explore the feasible solution, liberalism theory may be able to explain and exercise the application of complex interdependence relationship amongst the members, that with their common interest, could offer a means of addressing the scenario to increase the possibility to achieve their goal of net zero green emission by 2050 without having vulnerable citizens as collateral damage. Additionally, liberalism theory at its core tenets has a

democratic paradigm. This paradigm explains the dynamic and relationship amongst the EU Members and their sense of solidarity.

### **Research Method**

There are many academic literatures elaborating the current energy issues. The studies regarding the energy transition and the economy and political dimension of energy are a multidisciplinary topic, ranging from the technical issues to geopolitical issues. Therefore, the appropriate method for this kind of study would be by qualitative research and the appropriate approach for data collection would be captured thoroughly through Literature Review and data analysis/descriptive analysis.

The literatures included in this article are multi discipline academic journals across economic, political and security dimension, environment, relevant news and media, as well as books.

### **ANALYSIS**

The underlying factor for reducing the dependency to fossil fuel stemmed from the decarbonation agenda to attain net zero green emission. Net zero green emission is the condition where the consumption of fuel that emits carbon, will be offset with the equal amount of carbon removed from the atmosphere. EU has established the framework with directives issued since the late 1990s. In the past decade, in the period of 2008 – 2018, EU region has decreased its gas production by 46.4%, petroleum by 35.3% and solid fuel by 27.9%.

In 2020, the European region has been facing a critical energy crisis. This crisis arguably is one of the most severe situations in the past decades. EU production capacity for renewable energy before the crisis was at 37%, and 32% comes from nuclear energy from France (*What Do We Produce in the EU?*, n.d.). However, EU consumption mix only utilize around 15.5% renewable energy of the total consumption.

On the other hand, EU energy main supplies are still comprised of multiple imports from other countries: Russia, Norway, Middle East. Russia's export makes up the 46.7% of solid fuel imported in Europe. Norway comes as the second most reliable supplier to EU. This makes Russia is the main supplier of crude oil, natural gas and solid fossil fuels to Europe, and shows the high dependency towards gas and crude oil in spite of the progressive agenda in phasing down the fossil fuel consumption.

There was also argument that as the EU gears to make a transition to full clean energy and net zero emission by 2050, yet this ambitious goal is apparently not supported by its own ample renewable energy capacity and the transition may have not carefully prepared. Renewable energy power plant may not be ready for prime usage as it still relies heavily on the weather volatility nor other unpredictable natural forces. The one way to reduce the dependency towards the volatility of the weather may be to capitalize and increase the production capacity for renewable energy as well as the infrastructure and supply chain (Shum, 2019).

This may look like a hasty energy transition within the EU, despite of early efforts to make the energy transition seamless. With the intention to achieve the decarbonisation agenda, EU has issued directives on the single market on electricity in 1999 (96/92/EC), 2003 (03/54/EC) and 2009 (09/72/EC) (Pollitt, 2019). These directives were comprised of guidance from the EU to its members to participate in the electricity cross border trade. These directives were to be obliged by the members and the requirements were need to be incorporated in each of the member country's national legislation. But one of the obstacles in integrating this energy market in the region is the fact that most of these countries still rely on imported gas from Russian gas company, Gazprom, and it is known that Gazprom has been imposing different prices across the region and the highest price was imposed to eastern Europe countries (Siddi, 2016).

After years of implementing the integrated electricity/power market in Europe, EU also issued directives in 2001 (2001/77/EC) and 2009 (2009/28/EC) after a series of blackouts across the globe in 2003 called for increased connectivity between operators. One of the requirements from these directives was to increase the proportion of renewable sources into the energy mix. This arguably impact the rate of production in Europe, all the while the whole region still require significant energy and steady supply of power from reliable sources.

Moreover, using the framework of 5 dimensions of energy security, this crisis can be analysed more thoroughly to determine the priority of which EU needs to address. (Melly Cabarello-Anthony, 2015).

### **Security of Supply**

The certainty of supply is a major part to constitute an energy security in a region. Supply depends heavily on the market dynamics. EU is facing a disruption in energy supply due to the declining production capacity in the years before the pandemic and the high demand due to long winter and domestic demand from each exporting country. As mentioned earlier, Russia and Norway are two of the major suppliers to EU region. However, these two countries are also struggling to meet the demand from their own domestic market and global high demand.

Additionally, Russia is known to have an agreement with Germany to supply natural gas via Nord Stream 2 pipeline. Although it is unclear how much natural gas the Russia could be able to provide, this option could help EU region to alleviate its crisis. But this decision is highly controversial not only due to regulatory issues, but as well as the political issues. Especially after the escalation of the conflict between Russian – Ukraine. With the deeply infested realist view, being even more dependent to Russia would put EU region in a delicate position (Amalia & Yamin, 2017). Russia is currently being sanctioned with EU's ally, The United States of America. This sanction initially came as the result of the annexation of Ukraine by Russia

(Muhammad, 2015). The Nord Stream 2 project itself could also impacted Ukraine, as by approving this pipeline, Ukraine would lose its competitive position as the natural gas hub.

EU needs to anticipate and securitize the prolonged shortage of power needs for their industries and household consumption. Failing to do so would greatly impact EU's industrial output and eventually the GDP. Further, it could also have a moderate negative spill over effect to economic growth. There may be alternative of importing from the US and Qatar for LNG or, to the dismay of the environmental activists, to resort to coal to generate stable power needed for their region supplies. UK and France have anticipated disrupted supplies from Russia by establishing several LNG degasification plants for imported LNG in the shorelines of UK (Yergin, 2020). These arrangements were made with The United States of America, EU's closest ally and should ensure the security supplies in the coming years in the EU region while maintaining target of decarbonisation in 2050. However, the initial investment for LNG degasification would take a significant investment whereas the countries in EU are still reeling from the post pandemic financial turbulency.

The GDP of EU region in a normal condition pre covid is at USD 15,679.04 Billion, and in during the peak pandemic in 2020, that number decreased to USD 15,276.47 Billion (*European Union GDP - 2021 Data - 2022 Forecast - 1966-2020 Historical - Chart - News*, n.d.). It is now predicted with the current situation that the numbers could sink even lower as a result of a high energy prices as a direct impact from the escalation of the Ukraine – Russia crisis. This dependency to gas ironically came as an endeavour to reduce the carbon footprint from fossil fuel / crude oil in EU region.

At the time of the writing of this article, Russia had launched a military action to Ukraine, resulting to a greater scarcity of power in the next few years and put more pressure on the alternative but reliable source of energy in Europe. The impact of dependency towards energy imports

should become the moment of realization that EU should either increase its capacity in producing their own energy source (renewables and clean). The largest producer in EU region, France, in 2018 contributed its primary energy production at 137.9 Mtoe (Million tonnes of oil equivalent) which comprised of 78% of nuclear energy. However, weighing the cost effectiveness, and the inherent operational risk in nuclear energy, Russian gas still offer the most competitive pricing.

### **Security of Demand**

According to Cabarello, this dimension tends to be less elastic than the security of supply. An exporting country would require a security of demand to ensure profitable revenue to its national income. In the context of EU energy crisis, however, the level of demand in EU region apparently in a much higher proportion compared to the supply in 2020 to 2021. This may also be caused by the increase in economic activity post pandemic 2020, that each country is energy hungry and needs to grow and replenish its GDP as well as increasing the energy consumption due to extreme weather.

The total demand of electricity consumption can be used to determine the infrastructure, system and production forecast. This data would be important for EU to be able to come up with a feasible arrangement for renewable energy infrastructures and production. Currently, Europe uses gas supply from Russia to make fertilizer for crops in EU region. This means, the demand of natural gas in EU still relatively high and could impact the EU region's food security as well eventually. The percentage of imported gas used for fertilizer is at 50% from Russia (EU Agricultural Market Briefs, 2019), while the energy consumption demand in agriculture across EU is merely at 2.9%. And the remaining portion of the largest energy consumption in EU is for transport (30.5%), households (26.1%) and industry (25.8%) (Eurostat, 2020). These numbers show the high demand in EU region, and if no securitization over energy security is implemented, this crisis could escalate further to food security in EU region and ultimately will

disrupt the global food supply chain. By analysing the consumption pattern and estimation in each region, EU can strategize and adjust the production target for the members.

### **Security as Availability**

The reason the EU and many other countries aim for net green emission and reducing the dependency to fossil fuels, stems from the fact that fossil fuels is a finite resource and will not be available forever. Also considering the environmental cost that could leave a lasting impact for the next generation. The most important thing of this decision of using coal again temporarily or any other fossil fuels, is how the EU can regulate its consumption efficiently. Should it not regulated clearly, it will threaten the availability of the resource. From this argument, EU has already been decreasing its production on coal, solid fuel in the years leading towards the crisis. However, it was reported that in the middle of the crisis, some of its member countries are starting to burning up coal as the last resort amidst the protest from environmentalist. EU region is facing a dilemma whether to maintain its priority to increase its renewable energy capacity and to achieve its decarbonisation target or to secure a reliable and affordable source of energy for its region in the midst of the crisis onwards.

### **Security as Affordability**

Renewable energy does not come cheap. The substantial amount of investment is needed at the early stage of utilizing the technology. According to the recent study, there are different level of priorities and commitment towards green energy among 28 members of EU (Mata Pérez et al., 2019).

There are 5 highest income members of the EU, but there are also some members that have a lower income compare to the remaining members.

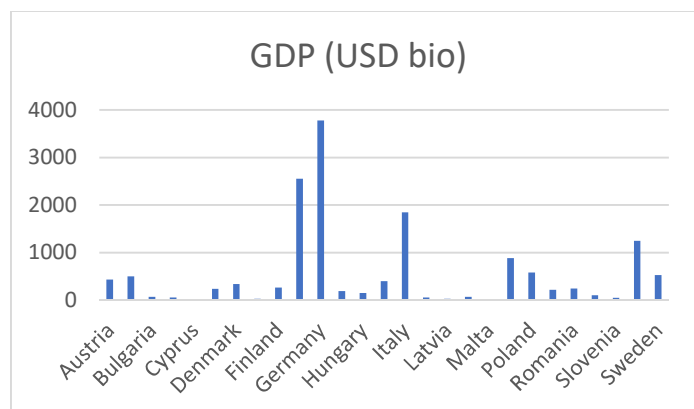


Figure 1. The 2020 GDP of EU Region.

Source: Compiled by author from various sources

This income discrepancy could lead to a low commitment and engagement to invest or to develop a reliable renewable technology in each member. If the EU would force its way to transition its region with full renewable energy, these countries need support. Otherwise, the most vulnerable citizen would bear the brunt of the rising price of the electricity bill.

### **Security as Sustainability**

According to the well-known Brundlant Report, the pursuit of economic development is sustainable only if we are able to meet 'the needs of the present without compromising the future'. EU is on the right path to make its transition towards a cleaner and sustainable energy. France has a nuclear plant that contributes 70% to generate electricity in Europe under normal circumstances. Nuclear is a cleaner and reliable than renewable energy power plant using solar cells, windmills and water turbine. However, the volatile nature of its source could make this investment on nuclear energy is not favourable in some of participating countries. The lessons came from Chernobyl and Fukushima nuclear power plant. It is important for EU to direct more extensive research and guidelines on nuclear energy to ensure the energy security for its region.

From these five dimensions, it could be drawn that Europe is in need for an applicable framework that could help and prevent such crisis from occurring again in the future. Examining their early priorities to shift the transition to renewable and decreasing production capacity in fossil fuel proves that it contributes to the threat to its security of availability and sustainability. Weighing the current situation, EU should shift its focus to ensure the region could have steady and reliable supply which could lead to affordability to its citizen in the region.

Strengthening regional and bilateral collaboration with its ally by enforcing and incentivized infrastructure investment should increase Europe's chance to deescalate the security issue during energy crisis due to premature energy transition and geopolitical shift that is happening during the Russian invasion in Ukraine.

Understanding the possible framework could be explained using the complex interdependence approach. This interdependence between the members and its allies are the example of the application of modern liberalism in the context of economy.

### **Complex Interdependence**

EU members has a complex interdependence amongst its members. EU is the international organization that could direct a mass energy transition by promoting a strong cooperation (Chifu, 2014). As identified that some of its members have different level of national income, EU could implement a program that would arrange a subsidized infrastructures, loan or grant. What EU needs to manage, however, is the willingness to help and solidarity amongst the member. While this is quite a liberalist approach, but EU itself is the prime example of a successful liberalism concept embodied in the form of a strong organization. In the year 2020, EU has launched Recovery and Resilience Programme with the aim to reduce the devastating impact from the pandemic. This program was established and it focused on the health, recovery of the economic and social issues, education &

childcare and green transition. This shows that a program that was intended for the benefit of EU members is feasible and applicable to be implemented. With this benchmark, EU could allocate more funding and resources towards the decreased independence to imports and increase research in renewable energy.

This program funding could come from capital market or a special multi financial framework budget from EU. The program would help to grant research funding or to build a reliable infrastructure in lower income members and offer a low interest for the loan. EU could also resort to capital market for financing this long-term project.

But this framework may not be able to prevent the next crisis before the infrastructures are well established. EU region may still want to use its share of imports and domestic production for fossil fuels for bridging the transition. Natural gas may hold the potential for the suitable technology during this period. Currently natural gas consumptions in EU is at 21% and Europe production of natural gas is at 8%. Natural gas although is also a finite resource, but it is a cleaner energy compares to solid fossil fuel that contributes to the rising temperature and vast environmental damage.

## **CONCLUSION**

Europe will have to strategize the energy transition with natural gas as bridging technology. EU will have to increase its investment on nuclear technology. Natural gas still makes substantial contribution required to provide the necessary and important energy bridge of the transition in EU to compensate the oil production decline as well as during the early 2000s. But given the nature of EU as an international and transnational organization, it should also assist and ensure its lower income members to overcome this challenge and regulate the electricity and energy access equality for all its members for its long-term strategy. By looking at the discussion pointers, EU should, at least for now, shift its focus from the security of sustainability, to the security of supply until the geopolitical tension has

decreased and until the development of the renewable infrastructure in EU has equally distributed and established.

This research warrants for a further study and review in determining the multiple macro-economic impact in the field of energy which also include the global supply chain disruption, worsened inflation and the economic fundamental of any impacted region.

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